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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/649,345

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EXAMINER

HAROON, ADEEL

ART UNIT

PAPER NUMBER

2618

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/649,345	<b>Applicant(s)</b> PELLAT ET AL.	
	<b>Examiner</b> Adeel Haroon	<b>Art Unit</b> 2618	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-17, 19-21, and 25-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Heck (U.S. 5,548,840).

With respect to claim 1, Heck discloses a process or checking the static currents of a direct conversion type of frequency transposition device in figures 2 and 3 (Column 2, line 60 – Column 3, line 11). Heck discloses a transconductor block, element numbers 318, 320, 326, and 328, for receiving the input signal and a current switching block, element numbers 306, 308, 310 and 312, connected to the output from the device (Column 3, lines 55-67). Heck discloses servocontrolling a common mode static output current from the frequency disposition device to a current proportional to a reference current outputted by element numbers 315 and 317, which makes it independent of a static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 2, Heck discloses servocontrolling a common mode input current to the current switching block to a current proportional to the reference current, which makes it independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 3, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 4, Heck teaches servocontrolling the common mode static output current from the frequency transposition device directly to the said current proportional to the reference current and independent of static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 5, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 6, Heck teaches servocontrolling the static output current to a current proportional to the reference current and independent of the static output current from the transconductor block by servocontrolling each input current to the current switching block onto a current proportional to the reference current independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 7, Heck discloses a direct conversion type of a frequency transposition device with a transconductor block, element numbers 318, 320, 326, and 328, for receiving the input signal and a current switching block, element numbers 306, 308, 310 and 312, connected to the output from the device (Column 3, lines 55-67). Heck further discloses servocontrolling a common mode static output current from the frequency disposition device to a current proportional to a reference current outputted by element numbers 315 and 317, which makes it independent of a static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 8, Heck discloses servocontrolling a common mode input current to the current switching block to a current proportional to the reference current, which makes it independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 9, Heck discloses a current source, element number 317, generating the reference current on its output terminal connected to a current switching block input and a single current amplifier, element number 316, having a first input connected to the output terminal from the current source, a second input connected to the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 10, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 11, Heck teaches servocontrolling the common mode static output current from the frequency transposition device to the said current proportional to the reference current and independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 12, Heck discloses a current source, element number 317, generating the reference current on its output terminal connected to a current switching block input and a single current amplifier, element number 316, having a first input connected to the output terminal from the current source, a second input connected to the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 13, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 14, Heck discloses servocontrolling a common mode input current to the current switching block to a current proportional to the reference current, which makes it independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 15, Heck discloses a current source, element numbers 315 and 317, generating the reference current on its output terminal connected to a current switching block input and first and second current amplifiers, element numbers 314 and 316, having a first input connected to the output terminal from the current source, a

Art Unit: 2618

second input connected to the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 16, Heck discloses an integrated circuit (Column 3, lines 63-67).

With respect to claim 17, Heck discloses a wireless communication system terminal, which includes a direct conversion type of a frequency transposition device with a transconductor block, element numbers 318, 320, 326, and 328, for receiving the input signal and a current switching block, element numbers 306, 308, 310 and 312, connected to the output from the device (Column 3, lines 55-67). Heck further discloses servocontrolling a common mode static output current from the frequency disposition device to a current proportional to a reference current outputted by element numbers 315 and 317, which makes it independent of a static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 19, Heck discloses servocontrolling a common mode input current to the current switching block to a current proportional to the reference current, which makes it independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 20, Heck discloses a current source, element number 317, generating the reference current on its output terminal connected to a current switching block input and a single current amplifier, element number 316, having a first input connected to the output terminal from the current source, a second input connected to

Art Unit: 2618

the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 21, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 25, Heck discloses servocontrolling each input current to the current switching block to a current proportional to the reference current and independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 26, Heck discloses a current source, element numbers 315 and 317, generating the reference current on its output terminal connected to a current switching block input and first and second current amplifiers, element numbers 314 and 316, having a first input connected to the output terminal from the current source, a second input connected to the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 27, Heck discloses a direct conversion frequency transposition device in figures 2 and 3 with an input, a radio frequency stage connected to the input, a current switching stage connected to the radio frequency stage, and an output connected to the current switching stage (Column 2, line 60- Column 3, line 11). Heck also discloses a servocontroller operable to control standby currents in the radio



Art Unit: 2618

frequency stage and current switching stage independently of each other (Column 3, lines 12-54).

With respect to claim 28, Heck further discloses that the radio frequency stage is a transconductor (Column 2, line 60 – Column 3, line 11).

With respect to claim 29, Heck discloses that the servocontrolled currents are standby output currents (Column 3, lines 12-54).

With respect to claim 30, Heck's system can be interpreted as direct servocontrolling.

With respect to claim 31, Heck discloses servocontrolling servocontrol the standby output current of the current switching stage directly to a current proportional to a reference current and independent of the standby output current of the radio frequency stage (Column 3, lines 12-54).

With respect to claim 32, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

With respect to claim 33, Heck's system can be interpreted as indirect servocontrolling.

With respect to claim 34, Heck discloses servocontrolling a common mode input current to the current switching block to a current proportional to the reference current, which makes it independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 35, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 18 and 22-24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heck (U.S. 5,548,840).

With respect to claim 18, the terminal of Heck is described above in the discussion of claim 17. Even though Heck discloses using the terminal in a radio communication system, Heck does not specifically teach a mobile cell phone. However, the examiner takes official notice that it is extremely well known in the art to use a mixer in a mobile cell phone, which is part of a radio communication system. Therefore, it would be obvious to one of ordinary skill in the art to use Heck's frequency transposition device in a mobile cell phone.

With respect to claim 22, Heck discloses directly servocontrolling common mode static output current from the frequency transposition device to the said current proportional to the reference current and independent of the static output current from the transconductor block (Column 3, lines 12-54).

With respect to claim 23, Heck discloses a current source, element number 317, generating the reference current on its output terminal connected to a current switching block input and a single current amplifier, element number 316, having a first input connected to the output terminal from the current source, a second input connected to the current switching block input and to the transconductor block output, and an output connected to the transconductor block output (Column 3, lines 12-54).

With respect to claim 24, Heck teaches using differential signals (Column 2, line 60 – Column 3, line 11). Heck teaches improving IM performance of a balanced mixer, which results in the difference between the differential input currents to the current switching block to zero (Column 2, lines 49-59).

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kung (U.S. 6,037,825) discloses a mixer with reference current source. Yan et al. (U.S. 6,819,914) disclose a differential mixer with control options. Beumer (U.S. 6,922,556) discloses a mixer with a feedback loop. Colli et al. (U.S.

Art Unit: 2618


5,587,682) disclose a mixer with a transconductor stage. Vagher (U.S. 6,021,323) discloses a direct conversion mixer with distortion elimination.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adeel Haroon whose telephone number is (571) 272-7405. The examiner can normally be reached on Monday thru Friday, 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**NGUYENT.VO  
PRIMARY EXAMINER**